We Claim:

CLAIMS

1. The use of compositions containing

A) a copolymer having at least one glass transition temperature of -30°C or lower and epoxy-reactive groups or a reaction product of this copolymer with a polyepoxide and

B) a reaction product of a polyurethane prepolymer and a polyphenol or aminophenol and

C) at least one epoxy resin,

as structural adhesives with good low-temperature impact strength.

2. The use of the compositions claimed in claim 1, characterized in that component A) is a butadiene-based copolymer.

3. The use of the compositions claimed in claim 2, characterized in that the copolymer of component A) is a carboxyl-containing copolymer based on butadiene/acrylonitrile, butadiene/(meth)acrylates, a butadiene/acrylonitrile/styrene copolymer or a butadiene/(meth)acrylate/styrene copolymer.

4. The use of the composition claimed in claim 1, characterized in that the copolymer of component A) is a core/shell polymer of which the core polymer is a diene polymer or a (meth)acrylate polymer with a glass transition temperature of -30°C or lower and which may optionally be crosslinked with 0.01 to 5% by weight of a diolefinic comonomer and of which the shell polymer has a glass transition temperature of 60°C or higher and is obtained from monomers from the group consisting of alkyl (meth)acrylate, (meth)acrylonitrile, (methyl) styrene and olefinically unsaturated carboxylic acids or carboxylic anhydrides or mixtures thereof.

5. The use of the compositions claimed in at least one of the preceding claims, characterized in that an adduct of an epoxy resin and a copolymer according to claims 2 to 4 is used as component A).

6. The use of the compositions claimed in at least one of the preceding claims, characterized in that component B) is a compound corresponding to formula I:

R^1-[X-(C=O)-NH-R^2-NH-(C=O)-Y-R^3-$(Z)_m]_n$ (I)

in which
m = 1 or 2,
n = 2 or 3,
R^1 is a residue of a polyalkylene glycol after removal of the functional groups (hydroxyl or amino groups),
R^2 = C_{6-14} alkyl, aryl, aralkyl (residue of a diisocyanate after removal of the isocyanate groups),
X,Y = -O-, -S- or -NR^4-, where R^4 = H or C_{1-4} alkyl or phenyl,
R^3 is a carbocyclic-aromatic or araliphatic m+1-functional residue with groups Z directly attached to the aromatic ring and Z = -OH or -NHR^4 (residue of a polyphenol or aminophenol after removal of the functional groups after removal of the isocyanate groups).

7. The use of the composition claimed in claims 1 to 6, characterized in that component B) according to claim 6 is dissolved in a liquid polyepoxide.

8. The use of the composition claimed in claims 1 to 5, characterized in that component B) according to claim 6 is reacted with a stoichiometric excess of a polyepoxide.

9. The use of the composition claimed in at least one of the preceding claims, characterized in that, in addition to components A), B) and C), it contains

D) a latent hardener from the group consisting of dicyanodiamide, guanamines, guanidines, aminoguanidines, solid aromatic diamines and/or a hardening accelerator and

E) optionally plasticizers, reactive diluents, rheology aids, fillers, wetting agents and/or antiagers and/or stabilizers.

10. The use of the compositions claimed in at least one of the preceding claims as a high-strength high-impact structural adhesive with an impact

peel energy of at least 5 J at -20°C (to ISO 11343) in vehicle construction, aircraft construction or rail vehicle construction.

11. The use of the compositions claimed in claim 10 for the production of composite materials, as potting compounds in the electrical and electronics industries and as a die-attach adhesive in the production of circuit boards in the electronics industry.

12. A composition for use as an adhesive, characterized in that, in addition to components A), B) and C) according to any of the preceding claims, it contains

D) a latent hardener from the group consisting of dicyanodiamide, guanamines, guanidines, aminoguanidines, solid aromatic diamines and/or a hardening accelerator

E) optionally plasticizers, reactive diluents, rheology aids, fillers, wetting agents and/or antiagers and/or stabilizers

F) a polyester polyol with a molecular weight of 400 to 5,000 and

G) optionally a thermoplastic polymer powder.

13. A process for hardening components A), B), C), D), E), optionally F) and optionally G) according to claim 12 by heating the composition to temperatures of 80°C to 210°C and preferably to temperatures of 120°C to 180°C.

14. A process for bonding metallic and/or composite materials comprising the following key process steps:

- applying the adhesive composition claimed in claim 12 to at least one of the substrate surfaces to be joined, optionally after cleaning and/or surface treatment
- fitting together the parts to be joined
- optionally pregelling the adhesive composition and
- curing the bond by heating the parts to temperatures of 80°C to 210°C and preferably to temperatures of 120°C to 180°C.